*Attributes/Conditions for Professional Learning Communities*

* Shared beliefs, values, and vision (re math, student learning, what success would look like, …)
* Shared and supportive leadership in terms of taking action within the program/department
* Collective learning and its application—organized to learn together and apply what they learn to their work with students
* Supportive conditions—structure, time, support, resources to pursue collective work across the department/program
* Shared personal practice—norm of bringing educational practice into public discourse within department/program and institution

Hord & Sommers, 2008

*Four Interconnected Process Goals Supporting the Improvement Student Learning in Math*

1. Enhancing teachers’ knowledge in mathematics and in pedagogical content knowledge related to mathematics
2. Increasing quality teaching, including opportunities to translate new knowledge into practice, especially around engaging students more effectively in their learning and deepening students’ mathematical understanding
3. Developing leadership capacity in both key faculty leaders and instructional administrators
4. Building an ongoing and collective culture of faculty inquiry and scholarship around teaching and learning “problems of practice”

*Possible Questions for Math Departments to Consider in Thinking about Project*

Students and Achievement Data

* Who are our students? What are their backgrounds in math? What are their approaches to learning math?
* What standards are in place for student learning?
* How are students performing in relation to those standards? What concepts, skills, attributes are students learning well or not learning well?
* What gaps in achievement exist among students?
* How is student learning monitored across the program on a regular basis? To what extent are assessments used formatively to guide teachers in improving instruction and students in improving their learning?

Teacher Learning Needs

* What goals and expectations do faculty have about their own professional learning?
* How are new faculty, especially PT, oriented to the department and supported in their teaching?
* What are faculty beliefs about and perceptions of professional development? What kind of experiences have faculty had with professional development at the college?
* What kind of experiences have faculty had with respect to implementing and evaluating new classroom practices?

Curriculum, Instruction and Assessment

* To what extent is the precollege math curriculum clearly defined and aligned with explicit learning standards? To what extent is the curriculum focused, rigorous, and coherent?
* How equitable is the curriculum in terms of accessibility for the full range of students who need the program—i.e., are students inappropriately tracked implicitly or explicitly through testing, advising, etc.?
* To what extent are students engaged in using reasoning skills and learning how to apply knowledge to novel problems? Are some groups of students receiving more of this kind of instruction than others?
* What methods of student assessment are used in classes and are the strategies consistent with the articulated learning goals/standards? Are different (and more varied) assessment strategies used with some student groups more than others?
* Is the classroom learning environment respectful of students and their diversity and conducive to all students’ active participation and collaboration?

Organizational Culture and Professional Learning Communities

* To what extent are shared values and a vision for student learning evident in the departmental culture?
* Are there structures and norms in place that support collaborative practice and opportunities for professional learning tied to classroom practice?
* How much conversation is there in faculty teams focused on mathematics teaching and learning?
* Do faculty routinely use evidence from student learning data or research when they discuss practice?
* How safe is it for faculty to discuss classroom practice with peers? Is reflective dialogue a norm for the department?
* Is there ongoing inquiry into beliefs about students and their capacities in math? Are assumptions about individual differences—including race, class, and educational background—talked about openly and critically examined?
* Is there any attention given to developing faculty collaboration and problem-solving skills?
* Are there clear collective answers to the questions: a) what do we want our students to learn?, b) how will we know?, and c) what will we do if they don’t?
* What professional development efforts are currently underway, and how do these efforts relate to the collective aims of the department?

Leadership

* What leadership roles are faculty playing, either informally or formally, in the work to improve student achievement in math, and how is faculty leadership being developed and supported?
* To what extent and in what ways are key administrator leaders—division chairs, deans, vice-presidents—involved in providing direction and support for the work in mathematics?
* What knowledge, skills and support are most needed by leaders to strengthen their role in supporting effective math learning?

Institutional Policies and Practices

* How do institutional policies and practices (contracts, schedules, incentive systems, etc.) impede or support collegial learning at the college? Focusing on core problems of teaching and learning? Equity issues?
* What incentives, both extrinsic and intrinsic, are provided for professional development?

Drawn and adapted from Loucks-Horsley, Susan, Stiles, Katherine E., Mundry, Susan, Lovd, Nancy, & Hewson, Peter V. Designing Professional Development for Teachers of Science and Mathematics, 3rd edition (2010). Corwin Press: Thousand Oaks, CA.